

VIEWING

OUR UNIVERSE

NASA science deals with a huge range of objects, times and distances. Events take place in milliseconds and across millions of years. Objects emit all forms of light, and even create ripples in the fabric of space and time. While scientists take this in stride with graphs and equations, artists and data visualizers bring the concepts home to the rest of us. In general, there are four types of visuals created by NASA and represented in this performance.

IMAGERY

This is the most familiar category, where we use the collection of light to create a picture. If the captured light is outside of the visible spectrum, it is either colored or left in black and white.

VISUALIZATION

When the data NASA collects isn't imagery, it can often be interpreted into a new visual form. Common examples are graphs and weather maps.

SIMULATION

By taking their understanding of the laws of nature, scientists can build models to examine what they can't observe firsthand. Such models can range from weather forecasts and colliding black holes to cosmic evolution. While visualizations use recorded data, simulations create new data.

ANIMATION

When there isn't enough information to create a visual, human imagination must take over. Animations may be entirely created by an artist, but the decisions are informed by science.

MORE INFORMATION

SUN
science.nasa.gov/heliophysics

EARTH
science.nasa.gov/earth-science

MOON
moon.nasa.gov

PLANETARY
solarsystem.nasa.gov

UNIVERSE
universe.nasa.gov

Cosmic Cycles: A Space Symphony is a groundbreaking collaboration between acclaimed composer Henry Dehlinger, NASA, and the National Philharmonic, featuring a unique fusion of music and video in seven multimedia works on the Sun, Earth, Moon, Planets, and Cosmos. This transformative project takes the audience on a captivating voyage through the universe, showcasing the beauty and power of the marriage between music and science.

FOR A SPECIAL COLLECTION OF THE VISUALS IN THIS PRESENTATION:

svs.gsfc.nasa.gov/gallery/cosmiccycles



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COSMIC CYCLES

A SPACE SYMPHONY

A Collaboration between

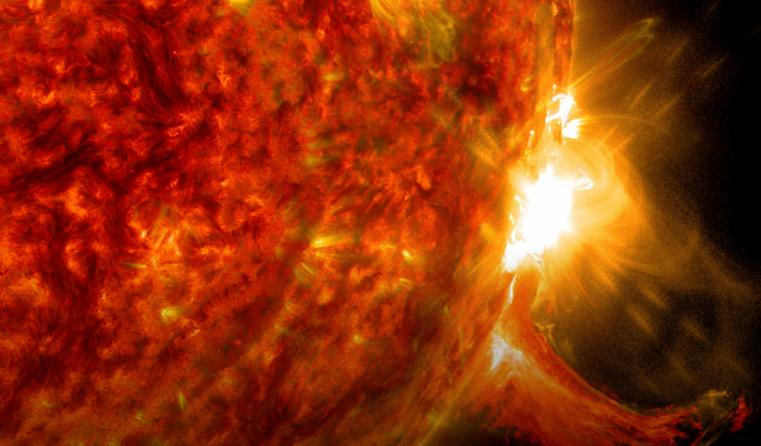
NASA'S GODDARD SPACE
FLIGHT CENTER

and

THE NATIONAL
PHILHARMONIC ORCHESTRA

Music composed by
HENRY DEHLINGER





 Born from a swirling cloud of dust and gas some 4.6 billion years ago, our Sun seethes and boils like a living thing. It is the very center of our solar system, and large enough to encompass 1.3 million Earths. Explosions flash on its surface in colors of light beyond human vision and enormous loops of plasma stretch into space. The Sun's influence extends out beyond the planets, creating a protective cocoon within the galaxy.

 Our constant companion in space, the Moon is the only celestial object that humanity has visited in person. Although by eye the Moon's surface looks flat and unchanging, recent measurements have shown it to be a rugged and dynamic environment. The most familiar object in the night sky, the Moon is our stepping stone to the rest of the cosmos.

 Nomads of the solar system, small objects like asteroids and comets wander among the planets. Messengers from the distant past, many of these small bodies include debris from the formation of the solar system and carry clues about its origins and the rise of life on Earth. NASA has visited some of them, recently reaching and then touching the asteroid Bennu to collect samples of rock unchanged for nearly 5 billion years.

 SUN

 EARTH

 MOON

 PLANETS

 TRAVELERS

 UNIVERSE

 Our home and the only planet we know of that possesses life. In the years since we first managed to leave Earth's atmosphere, our understanding of it has grown exponentially. NASA now observes and measures Earth with an unmatched fleet of spacecraft. Our influence on this incredibly complex and ever-changing sphere is both obvious and insignificant.

 Earth's siblings, the other planets were created at the birth of the solar system. They give us a glimpse of the variety possible in the universe and how rare Earth is. As we explore these other worlds, we fuel our adventurous spirit and discover new wonders at every turn: riverbeds on Mars, volcanoes on Jupiter's moon Io, auroras on Saturn, and sulfuric-acid clouds on Venus.

 NASA studies the makeup and workings of the universe, from the smallest particles of matter and energy to its large-scale structure and evolution. Scientists look far back in space and time to learn the full cosmic history of stars and galaxies. They tease out details of the environments around black holes and observe the most powerful explosions since the big bang. NASA is discovering numerous planets beyond our solar system, decoding how planetary systems form, and learning how environments hospitable for life develop.

